

# **An incipient fault detection system based on the probabilistic radial basis function network. Application to the diagnosis of the condenser of a coal power plant**

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## **Abstract-**

**This paper introduces the probabilistic radial function network (PRBFN) and a new incipient fault detection system based on it. The PRBFN is a neural network model able to estimate I/O mappings and probability density functions. These capabilities play a crucial role in the design of the proposed fault detection system, where faults are detected by comparing the actual behaviour of the plant with the predicted using a model of normal operation conditions. Once the reliable domain of the model has been defined, a comparison is made through a local estimation of the upper bound of the resulting residual under normal operation conditions. This procedure automatically adjusts the sensitivity of the fault detection system to the intrinsic characteristics of the underlying process and prevents false alarms by detecting unknown operating conditions.**

**Index Terms- Fault detection; Diagnosis; Neural Networks; Power plant monitoring**

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